DRAFT

AUG 6 1990

Dick -
Please look at Esp. MIT + Aquifer exemption for

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 147

[FRL- -]

Osage Mineral Reserve Underground Injection Control Program

AGENCY: Environmental Protection Agency

ACTION: Proposed Rule

SUMMARY: The Environmental Protection Agency (EPA) is proposing amendments to its Underground Injection Control (UIC) program regulations for the Osage Mineral Reserve in Oklahoma (40 CFR Part 147, Subpart GGG) to allow the Director flexibility to waive mechanical integrity requirements for temporarily abandoned wells, to allow the use of continuous water level monitoring as an acceptable monitoring method to demonstrate nonendangerment to underground sources of drinking water (USDWs), and to designate a portion of the Happy Hollow and Z-Sand aquifers in western Osage County, Oklahoma as exempted aquifers. The proposed changes will provide the Director with the same flexibility that presently exists in the generic Federal UIC regulations (see 40 CFR §§ 144.28(c)(2)(iv) and 144.52(a)(6)) to waive certain technical requirements applicable to active injection wells upon a demonstration by the owner or operator that the well will not endanger USDWs during the period of temporary abandonment. The aquifer exemptions would be limited to injection of water of a quality equal to or better than that contained in the proposed exempted aquifer.

DATE: EPA will accept public comment on the proposed rule

until (insert date 45 days from the date of publication in the Federal Register); a public hearing will be held on _____, at _____; requests to present oral testimony must be received on or before _____. EPA reserves the right to forego the hearing if sufficient public interest is not expressed.

ADDRESSES: Comments, requests to testify, and inquiries concerning the Public Docket should be addressed to Comment Clerk, Underground Injection Control Branch, State Programs Division, Office of Drinking Water (WH-550E), 401 M Street, SW., Washington, DC 20460. The docket for today's proposal will be available for public inspection and copying in 1140 East Tower at EPA Headquarters and EPA's Region VI Office, Room _____, 1445 Ross Avenue, Dallas, TX 75202.

The hearing will be held at the following location:

FOR FURTHER INFORMATION CONTACT: Donald M. Olson, Underground Injection Control Branch, State Programs Division, Office of Drinking Water (WH-550E), EPA, 401 M Street, SW, Washington DC, 20460, Telephone: (202) 382-5530.

SUPPLEMENT INFORMATION:

I. Background

The Safe Drinking Water Act (SDWA) authorizes EPA to regulate underground injection activity on all lands in the United States, including Indian lands. (EPA has adopted the definition of "Indian country" found at 18 U.S.C. 1151, as the

definition of "Indian lands" for the Direct Implementation UIC program. It is set forth in full at 40 CFR § 144.3). The 1986 Amendments to the SDWA specifically directed EPA to promulgate by March 1987 a federal UIC program for all indian lands not already covered by an applicable UIC program.

In September 1983, (48 FR 40100 **et seq.**) EPA proposed four alternative approaches to promulgating UIC programs on Indian lands in States with approved State-administered programs: (1) Implement a program consisting of current UIC minimum requirements; (2) implement a program consisting of requirements patterned after State requirements from the approved program applicable to the rest of the State; (3) adopt a combination of the minimum UIC requirements and the approved State program requirements; or (4) develop unique requirements in response to Indian concerns or other special circumstances. After reviewing comments, EPA published its intent to use any of the four proposed options appropriate to the individual case when implementing programs for Indian lands in primacy States (49 FR 20140, May 11, 1984 **et seq.**).

On November 15, 1984 (49 FR 45292 **et seq.**) EPA promulgated a UIC program for Class II wells on the Osage Mineral Reserve in Oklahoma. The Osage program was designed according to a combination of Options (3) and (4), and consisted of requirements drawn from the UIC minimum requirements regulations, the Oklahoma Corporation Commission regulations, the Bureau of Indian Affairs regulations, and unique requirements developed to reflect Indian

concerns. A program to regulate Class I, III, IV, and V wells for the Osage Mineral reserve and other Indian lands in Oklahoma was developed seperately and promulgated on October 25, 1988 (53 FR 43096 **et seq.**).

II. Existing Osage Mineral Reserve Program

The UIC program for Class II wells on the Osage Mineral Reserve consists of the basic program elements contained in the Federal UIC minimum requirements: general program requirements, program requirements and technical standards for wells authorized by rule, program requirements and technical standards for wells authorized by permit, and procedural requirements (including public participation) for the permitting process. Although the format or means of administration of these standards varies from the minimum requirements, the substantive standards themselves are equivalent to the minimum requirements with only few and limited exceptions.

Some variations result from the attempts to maintain consistency with the program of the Oklahoma Corporation Commission applicable in the rest of the State. Although that program has been approved by EPA, it does not in every case meet precisely the UIC minimum requirements regulations, because strict equivalence is not required of State Class II programs under Section 1425 of the SDWA. Other variations result from conforming the Osage program to the existing BIA program, or to tribal preferences. Section 144.2 of EPA's regulations provides the flexibility to promulgate programs on Indian lands that

contain such variations. The major differences, and the rational for the differences and the proposed modifications to those provisions, are outlined below.

A. Notice of Plugging and Abandonment (Minimum Requirements §§ 144.21(c)(4), 144.22(a)(4), 144.51(n), and §§ 144.28(j)(1) and (c)(2)(iii) and 144.52(a)(6); Osage § 147.2905

EPA's minimum requirements regulations require that wells be plugged when they are abandoned (§ 146.10), but provide that temporary and intermittent cessation shall not be considered abandonment (§§ 144.21(c)(5), 144.22(a)(5), and 144.52(a)(6)). For EPA administered programs generally, EPA has provided that any cessation of injection that extends longer than two years will not be considered "temporary and intermittent," and that, therefore, the well must be plugged unless the owner or operator notifies the Regional Administrator and demonstrates maintenance procedures that will ensure no endangerment of USDWs during the period of abandonment. To achieve consistency with the Oklahoma Corporation Commission's (OCC) requirements that apply elsewhere in Oklahoma, EPA had proposed a six month plugging and abandonment period in Osage County (49 FR 20238, May 11, 1984.). However, after receiving and considering comments for and against the six month plugging and abandonment requirements, EPA decided that a well be properly plugged and abandoned within one year of ceasing injection unless the owner or operator demonstrates that the well will be reactivated (49 FR 45292 **et seq.**) OCC subsequently modified its plugging and abandonment requirements

to one year and EPA's requirement is presently consistent with the State's.

B. Operating Requirements (Minimum Requirements: § 148.8, Osage: §§ 147.2912(a) and 147.2912(b)).

EPA proposed to allow operators to demonstrate there is no significant leaks in the casing, tubing or packer by:

1. A pressure test of the casing/tubing annulus to the maximum injection pressure, but not less than 200 psi; or,

2. Monitoring the pressure in the casing tubing annulus, following an initial pressure test.

The Agency received more comments on the proposed pressure testing of the casing/tubing annulus than any other provision in the proposed Osage regulations (49 FR 45292 et seq.). Since both the EPA general technical requirements for UIC programs (40 CFR Part 146) and the Osage regulations (40 CFR Part 147, Subpart GGG) require as a fundemental minimum that each well have mechanical integrity, EPA decided to consider no options which would allow wells to operate if there are significant leaks in the casing. For the same reason, EPA decided not to allow waivers of mechanical integrity testing. The regulations do, however, provide for alternate tests when approved by the Administrator/Regional Administrator on a case-by-case basis.

C. Exempted Aquifers

In the minimum requirements, EPA defines underground sources of drinking water (USDW) quite broadly, but allows exemptions of

certain aquifers from treatment as USDWs if they meet certain criteria in §146.4 that indicate their unsuitability for use as drinking water. The exemption of an aquifer may allow owners or operators of a class or classes of wells to inject into what would otherwise be afforded protection as a USDW. Section 147.2908 allows the Administrator to exempt an aquifer, or part of an aquifer, if it does not serve as a source of drinking water, and will not in the future serve as a source of drinking water because:

(1) It is hydrocarbon producing, can be demonstrated by a permit applicant as part of a permit application for a Class II operation to contain hydrocarbons that are expected to be commercially producible (based on historical production or geologic information); or

(2) It is situated at a depth or location that would make recovery of water for drinking water purposes economically or technically impractical; or

(3) It is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption.

In addition, aquifers or their portions with total dissolved solids (TDS) content that is more than 3,000 and less than 10,000 mg/1 and it is not reasonably expected to supply a public water system may be exempted.

EPA classifies aquifer exemptions as either "major" or "minor." Major exemptions are defined as any exemption of an

aquifer containing less than 3,000 mg/1 total dissolved solids that is (a) related to any Class I or IV well; or (b) not related to a single permitting action or a single existing enhanced recovery well or project authorized by rule.

All exemptions not defined as major are considered to be minor. Minor exemptions therefore include all exemptions considered as part of a single permitting action. When considred as part of a single permitting action, the permitting process will provide public notice and opportunity for comment and for a hearing, the exemption will be limited to a defined area around the well or facility, and the effect of the exemption will be limited to the activities authorized under the permit. For a single enhanced recovery well or project, EPA will conduct the aquifer exemption process according to the same public participation procedures as provided for permitting actions. Also considered minor exemptions will be those approved because the aquifer contains more than 3,000 mg/1 total dissolved solids and "is not reasonably expected to supply a public water system" see §146.4(c). This is consistent with the procedures for EPA approval of these exemptions under approved State-administered programs, for which §144.7 places a 45-day time limit on EPA approval disapproval of the exemption.

III. Proposed Revisions to the Osage Mineral Reserve Program

A. Plugging and Abandonment Requirements

EPA is proposing to change the plugging and abandonment requirements of Section 147.2905(a) to allow an owner/operator to

seek to extend the period of temporary abandonment by (i) providing notice to the Regional Administrator and (ii) describing actions or procedures satisfactory to the Regional Administrator that the owner/operator will take to ensure that the well will not endanger USDW's during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells unless waived by the Regional Administrator. However, temporarily abandoned wells may not begin injection operation without first having demonstrated mechanical integrity. This change will conform the Osage program to the generic requirements of 144.28 and 144.52.

The Osage program has been directly implemented by EPA ~~in operation~~ for five years, and experience indicates that there is a need for more flexibility in the plugging and abandonment requirements. In times of relative price stability, the costs of oil and gas production versus income can determine the economic life of a field and individual wells. With the downturn in oil prices since late 1983, many fields and wells are not presently in production because production costs exceed revenue. However, the Osage Tribe and the owner/operators wish to preserve existing wells for the day when increased oil prices will support renewed production. The Safe Drinking Water Act instructs EPA to avoid any regulation which unnecessarily impedes the production of oil and gas, as long as USDW's are not endangered. The proposed modification would provide the Regional Administrator with the

flexibility to allow such temporary abandonment on a case-by-case basis where there is no threat of endangerment to USDWs.

The concern with abandoned injection wells is that they may allow fluids to move from the injection zones into USDW's or allow fluids in one formation to migrate into another formation. This can happen if mechanical integrity is lost. Proper plugging and abandonment requires setting concrete plugs in the well bore to block any such migration. The concern with a temporarily abandoned well is that over time the casing will corrode and/or be damaged so as to allow fluid migration.

At the time EPA promulgated the Osage program, EPA believed that the discretion provided by the generic regulations was not needed in the one county Osage program where oil production occurs primarily in two fields and the hydrogeology is well documented and homogeneous. In addition, there was a concern to ensure consistency with the State program approved by Oklahoma, and yet not disrupt the program of the BIA or ignore the preferences of the Osage Tribe. EPA now believes, based on five years of direct implementation experience, that the flexibility provided in the generic UIC program regulations to extend the plugging and abandonment requirement is a necessary change to the current Osage program that will not lessen the level of protection presently afforded USDW's. The flexibility provided by the proposed changes will allow EPA to extend the period of temporary abandonment so that wells which today are not being used for enhanced recovery or salt water disposal, but may be

There are more than two fields in Osage County

Delete - where oil production occurs primarily in two fields and

used in the future, can remain unplugged and available for future use. Additionally, EPA believes that the use of fluid level monitoring of the static water level in the well to verify that the water level remains seperated by a safe distance from the lowermost USDW offers a practical means of ensuring that temporarily abandoned wells do not endanger USDWs. ~~EPA has not experienced any difficulties implementing this requirement in its other 17 direct implementation programs.~~

B. Mechanical Integrity Testing

The comments EPA received on the proposed Osage program regulations included the suggestion that the fluid level in the casing/tubing annulus be monitored and as long as the fluid level remained below the base of the USDW, the well did not need mechanical integrity testing. EPA at that time decided to consider no options which would allow wells to operate if there are significant leaks in the casing (49 FR 45292). Since promulgation of the Osage program, EPA was sued by Phillips Petroleum Company (Phillips v EPA, Civil Case No. 88-1114). As part of EPA's settlement of this case, EPA agreed to allow Phillips to implement a continuous monitoring program which would immediately detect and warn the operator when the fluid level in the casing-tubing annulus within reached within 100 feet of the base of the lowermost USDW, for all active wells with casing leaks and for inactive wells which have not demonstrated mechanical integrity.

Since entering in this agreement with EPA in October 1988,

Phillips has installed continuous water level monitoring systems in 540 wells in the North and South Burbank units. This monitoring program has proven to be effective in maintaining a safe seperation distance between the USDW and any injectate. Phillips has reported 25 wells where the fluid level rose to within 50 feet or less below the lowermost USDW. These wells were immediately shut-in and the wells have either been repaired or plugged and abandoned. In no case has any USDW contamination occurred.

Delete it is sufficient to say that it works

The continuous monitoring system employed by Phillips does not satisfy the requirements of § 147.2912(a)(1) for demonstration of mechanical integrity of the well casing. It does, however, provide a method of monitoring which provides an adequate safety margin in terms of time and vertical distance so that the well may be managed so as to prevent any possible USDW contamination.

It was the intent of the Osage UIC program regulations in § 147.2912(a)(1)(v) to provide flexibility to the Regional Administrator to make case-by-case determinations as to whether or not a given monitoring or testing method could be used to demonstrate mechanical integrity of the casing, tubing or packer. This provision was particularly aimed at providing flexibility to consider new technologies or methods that were not proven at the time of program promulgation. EPA believes that the monitoring system developed by Phillips and installed in 540? wells in the North and South Burbank units, while it does not fall under the

category of an approved test for casing mechanical integrity, does fall within the intent of the regulations and may be approved for use in Osage County because it provides an adequate safeguard for the overlying USDW.

B. Aquifer Exemptions

EPA is proposing to designate a portion of the Happy Hollow and Z-Sand aquifers in western Osage County, Oklahoma as exempted aquifers in accordance with 40 CFR 147.2908. The aquifer exemptions would be limited to Class II injection of water of a quality equal to or better than that contained in the proposed exempted aquifers.

The Z-Sand is a locally named sandstone of the Buck Creek Formation of the Pennsylvania series. It ranges in thickness between 40 and 60 feet. The Happy Hollow is a limestone, also in the Buck Creek Formation. It is located approximately 100 feet above the Z-Sand and ranges in thickness between 10 and 30 feet. In the area proposed to be exempted, the two units occur at depths between 500 and 800 feet below the land surface. The confining layer between the shallow USDW's and the top of the Happy Hollow and/or Z-Sand ranges between 350 feet and 500 feet and contains 125 to 150 feet of cumulative shale.

The proposed area of the exemption is sparsely populated ranching country and all drinking water is obtained from a rural water system which obtain its water supply from another aquifer outside of the exempted area. ~~A survey was conducted and~~ No water supply wells were located which tap the Happy Hollow or Z-

Sand aquifers ~~are located~~ within the proposed exempted area ~~area~~.

Based on an evaluation of electric logs and actual water analyses, the operator has satisfactorily demonstrated that the two aquifers contain ground water with total dissolved solids of more than 3,000 mg/l and it is not reasonable to expect them to supply a public water system because of the good quality water available through the rural water system. The operator also submitted data comparing the costs of obtaining a water supply from the Happy Hollow or Z-Sand with that of the rural water system to substantiate that the aquifers are situated at a depth which makes recovery of water for drinking water purposes economically impractical.

These proposed exemptions become effective 30 days after publication of the final rule in the Federal Register. Public comment is invited, particularly if information is available to show that any of the formations proposed to be exempted are currently serving as sources of drinking water, or if there is other current injection activity into USDWs where exemptions are not proposed.

IV. Regulatory Impact

A. Executive Order 12291

Under Executive Order 12291, EPA must judge whether the proposed amendments to the regulations are major and therefore subject to the requirements of a Regulatory Impact Analysis. The proposed amendments do not impose any additional burden on the States or the regulated community. The proposed amendments do

not have an annual effect on the economy of $100 million or more, nor do they satisfy any of the other criteria listed in section 1(b) of the Executive Order. Therefore the proposed amendments do not constitute a major rulemaking. This proposal has been submitted to the Office of Management and Budget (OMB) for review as required by Executive Order 12291.

B. Paperwork Reduction Act

EPA has determined that the Paperwork Reduction Act, 44 U.S.C. 3501 **et seq.**, does not apply to this proposed rule since no information collection or recordkeeping would be involved. This proposed rule would merely exempt specific portions of certain aquifers for the purposes of Class II injection in the Osage Mineral Reserve and any information collection or recordkeeping requirments have already been approved by OMB under control number 2040-0042. Therefore, a seperate information collection request was not prepared for this proposed rule.

C. Regulatory Flexibility Analysis

Under the Regulatory Flexibility Act, 5 U.S.C. 601 **et seq.**, an agency is required to prepare an initial regulatory flexibility analysis whenever it is required to publish general notice of any proposed rule, unless the head of the agency certifies that the rule, if promulgated, will not have a significant impact on a substantial number of small entities. The proposed amendments to the regulations requires no additional reporting or other burdens on the regulated community. Therefore, the Administrator certifies that this regulation will

not have a significant impact on a substantial number of small entities.

Dated:_____

_____

William K. Reilly

Administrator

For the reasons set out in the preamble, Part 147 of title 40 of the Code of Federal Regulations is proposed to be amended as follows:

Part 147 -- State Underground Injection Control Programs

1. The authority citation for Part 147 continues to read as follows:

Authority: 42 U.S.C. 300h **et seq.**; and 42 U.S.C. 9901 **et seq.**

2. Part 147, Subpart GGG is proposed to be amended by revising the introductory material and Section 147.2905(a), adding a new § 147.2905(b) and redesignating paragraphs (b) through (j) as (c) through (k) to read as follows:

§ 147.2905 Plugging and abandonment.

The owner/operator shall notify the Osage UIC office within 30 days of the date injection has terminated. After cessation of operations of one year the owner or operator shall plug and abandon the well in accordance with an EPA approved plan unless

he:

(a) Provides written notice to the Regional Administrator;

(b) Describes actions or procedures, satisfactory to the Regional Administrator, that the owner or operator will take to ensure that the well will not endanger USDWs during the period of temporary abandonment and provides a viable plan for utilizing the well within a reasonable time. These actions and procedures shall include annual reports on the status of all temporarily abandoned wells, and compliance with the technical requirements applicable to active injection wells listed in §§ 147.2912 and 147.2920 unless waived by the Regional Administrator. Such actions as monthly monitoring and annual reporting of the static fluid level in the well to ensure adequate seperation between the water level and the lowermost USDW is an acceptable method to demonstrate nonendangerment.

* * * * *

3. Section 147.2912 is proposed to be amended by the addition of subsection (d) to read as follows:

§147.2912 <u>Operating requirements for wells authorized by rule.</u>

* * * * *

(a) * * *

* * * * *

(d) The Regional Administrator, on a case-by-case basis, may allow the operation of a well with casing failure only, provided non-endangerment of a USDW can be demonstrated by a

This is here only as an example and

Delete unless methods doesn't change our procedure. Quarterly monitoring if more than 100 ft below USDW. Annual at West Little Creek, etc. Even at that this is unnecessary

program of continuous monitoring of the tubing/casing annulus and ~~semi-~~annual measurement of the actual annulus fluid level.

4. Section 147.2908 is proposed to be amended by adding a new paragraph (c) to read as follows:

§147.2908 Aquifer Exemptions.

* * * * *

(c) In Accordance with subsections (a) and (b) of this section, those portions of aquifers described below are hereby exempted for the purpose of Class II injection activity. This exemption applies only to those portions of the Happy Hollow and Z-Sand aquifers defined on the surface by an outer boundary of those quarter sections tabulated below. The portions of the aquifers being exempted are located at a depth below land surface between 500 and 800 feet and the exemption is limited to injection of water of a quality equal to or better than that contained in the exempted aquifers.

LOCATION
T 25, R 6E - NW/4, SW/4 Section 2
T 25, R 6E - Section 3
T 25, R 6E - Section 4
T 25, R 6E - NE/4, SW/4, SE/4, Section 5
T 25, R 6E - SE/4, Section 6
T 25, R 6E - Section 7

T 25, R 6E - Section 8

T 25, R 6E - Section 9

T 25, R 6E - Section 10

T 25, R 6E - NW/4 Section 15

T 25, R 6E - Section 17

T 26, R 6E - Section 1

T 26, R 6E - NE, NW, Section 9

T 26, R 6E - NE/4, NW/4, SE/4, Section 10

T 26, R 6E - Section 11

T 26, R 6E - Section 12

T 26, R 6E - Section 13

T 26, R 6E - Section 14

T 26, R 6E - NE/4, SE/4 Section 15

T 26, R 6E - Section 22

T 26, R 6E - Section 23

T 26, R 6E - SW/4 Section 26

T 26, R 6E - Section 27

T 26, R 6E - NE 4, SE/4 Section 33

T 26, R 6E - Section 34

T 26, R 6E - NW/4, SW/4 Section 35

T 27, R 6E - Section 36

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